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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,342	02/11/2004	Guy Peter Bryan-Brown	124-1062	8551
23117	7590	12/29/2005	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			SCHECHTER, ANDREW M	
			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/775,342	Applicant(s) BRYAN-BROWN ET AL.	
	Examiner Andrew Schechter	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2005.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-36 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 17-36 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 11 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/043,788.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 5 October 2005 have been fully considered but they are not persuasive.

The terminal disclaimer filed on 5 October 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of the three patents listed therein has been reviewed and is accepted. The terminal disclaimer has been recorded. The previous double patenting rejections are therefore withdrawn.

The applicant argues [p. 5] that *Nobili* discloses a bistable LCD in which the two stable states differ in azimuthal angle but have the same zenithal angle. The applicant further argues that the term "pretilt" from the claims refers to the tilt angle, which the applicant argues is the azimuthal angle rather than the zenithal angle. This is not persuasive. The terms "azimuthal" and "zenithal" are not recited in the claims, and to the examiner the term "pretilt" refers broadly to the alignment of the liquid crystal molecules at the surface. Two regions in which the liquid crystal molecules have the same zenithal angles but different azimuthal angles constitute two different alignments of the liquid crystal molecules, and hence two different "pretilts". Similarly, the directions of the molecules would be described by different "pretilt angles" (in the case of *Nobili*, different azimuthal pretilt angles).

The applicant argues [p. 6] that *Tsuda* discloses two different monostable arrangements rather than bistable ones. The applicant then recites the limitation of a “bistable pretilt” in claim 17. This is not persuasive. *Tsuda* was applied to claim 32 not claim 17; the limitations of claim 17 are irrelevant. Claim 32 does not recite a “bistable pretilt”, and *Tsuda* does meet all the limitations of claim 32 as discussed in the rejection.

Similarly, the applicant argues [pp. 6-7] that *Li* discloses a monostable rather than bistable arrangement. Again, this is not persuasive as claims 32-35 do not recite bistability in contrast to the other claims, which allows the scope of claims 32-35 to include separate monostable pretilt arrangements side-by-side, for instance.

The applicant argues [pp. 7-8] that *Boyd*’s surfaces “do not provide the claimed different pretilt angles or the bistability described in claim 32”. This is not persuasive. Again, (though *Boyd* does in fact disclose bistability) the examiner notes that claim 32 does not actually recite bistability. Also, *Boyd* does disclose a cell “having at least one cell wall having a first surface to provide two different pretilt angles” . The quotation from the examiner in a previous case refers to whether the “grating” in the *Boyd* reference “permit/requires/provides, in short, is responsible for the different pretilt angles and bistable configurations”; the quote is not relevant to whether the surfaces in *Boyd* provide two different pretilt angles (which they clearly do: “two substrates which are fabricated to contain an array of singular points” [abstract], “[m]echanically stable liquid crystal configurations are achieved by providing appropriate boundary conditions on the surfaces of the substrates” [col. 1, lines 36-39], etc.).

The previous prior art rejections are therefore maintained.

Specification

2. The disclosure is objected to because of the following informalities: the amendment to the specification on 5 October 2005 lists three US patents, with the numbers of the last two being incorrect; each should begin with "6" rather than "4".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 17-19 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by *Nobili et al.*, "Surface Walls on a Bistable Anchoring of Nematic Liquid Crystals", J. Phys. II France 5 (April 1995).

Nobili discloses [see p. 535, Fig. 5b, for instance] a bistable nematic liquid crystal device comprising a first cell wall [bottom] and a second cell wall [top] enclosing a layer of liquid crystal material, wherein said first cell wall has a first surface treated to provide a bistable pretilt to molecules of liquid crystal material and said second cell wall has a

first surface treated to provide monostable alignment to molecules of liquid crystal material, wherein said bistable nematic liquid crystal device provides two stable and optically distinguishable liquid crystal configurations [at B and B', left and right of Fig. 5b, for instance]. Claim 17 is therefore anticipated.

The first surface of the second cell wall has a homeotropic surface treatment, so claim 18 is also anticipated. The liquid crystal material is nematic, so claim 19 is also anticipated. The first cell wall's first surface is treated to provide two different pretilt angles, so claim 36 is also anticipated.

5. Claim 32 is rejected under 35 U.S.C. 102(b) as being anticipated by *Tsuda et al.*, U.S. Patent No. 5,280,375.

Tsuda discloses [see Fig. 1] an LCD providing first and second stable liquid crystal configurations [right and left of Fig. 1] which are optically distinguishable, a cell having a cell wall with a first surface to provide two different pretilt angles [4, 6] in the same azimuthal plane, wherein the first stable configuration is twisted [see Fig. 4]. Claim 32 is therefore anticipated.

6. Claims 32, 34, and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by *Li et al.*, U.S. Patent No. 5,831,700.

Li discloses [see Fig. 1] an LCD providing first and second stable liquid crystal configurations [right and left of Fig. 1] which are optically distinguishable, a cell having a cell wall with a first surface to provide two different pretilt angles in the same azimuthal plane, wherein the first stable configuration is twisted. Claim 32 is therefore anticipated.

Li discloses using either positive or negative dielectric anisotropy liquid crystal [col. 7, lines 46-56], so claims 34 and 35 are also anticipated.

7. Claims 32-35 are rejected under 35 U.S.C. 102(b) as being anticipated by *Boyd et al.*, U.S. Patent No. 4,333,708.

Boyd discloses [see Fig. 6] an LCD with first and second stable liquid crystal configurations, optically distinguishable, a cell with cell wall having first surface to provide two different pretilt angles [1093, 1094] in the same azimuthal plane, wherein the first configuration is twisted [on the left]. Claim 32 is therefore anticipated.

The second configuration is non-twisted [in the middle], so claim 33 is also anticipated. The liquid crystal material used can exhibit both positive and negative anisotropy [col. 2, lines 58-64], so claims 34 and 35 are also anticipated.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Nobili et al.*, "Surface Walls on a Bistable Anchoring of Nematic Liquid Crystals", J. Phys. II France 5 (April 1995) as applied above, in view of *Funada et al.*, U.S. Patent No. 4,486,760.

Nobili may or may not disclose using long pitch cholesteric liquid crystal material in the bistable nematic device. *Funada* teaches that the twisted nematic liquid crystal layer in an analogous device can be either a nematic liquid crystal or a long pitch cholesteric liquid crystal [col. 2, lines 12-14]. This is evidence that the two were considered art-recognized equivalents as choices for the liquid crystal layer in such devices. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a long pitch cholesteric material, motivated by the art-recognized equivalence of the two options. Claim 20 is therefore unpatentable.

10. Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Nobili et al.*, "Surface Walls on a Bistable Anchoring of Nematic Liquid Crystals", J. Phys. II France 5 (April 1995) as applied above, in view of *Tsuboyama et al.*, U.S. Patent No. 4,775,225.

Nobili may or may not disclose having pillars on the first surface of the first cell wall. *Tsuboyama* discloses having such pillars [307] in an analogous device. It would have been obvious to one of ordinary skill in the art at the time of the invention to have such pillars, motivated by *Tsuboyama's* teaching that such spacers maintain a cell gap and provide good bistability free of orientation defects [col. 2, lines 34-38]. Claim 21 is therefore unpatentable.

The height of *Tsuboyama's* pillars is given as 1 μm [col. 13, line 35] and the width of such pillars was in the range 5-50 μm or greater than 50 μm [see Table 1], so claims 22-24 are also unpatentable.

11. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Nobili et al.*, "Surface Walls on a Bistable Anchoring of Nematic Liquid Crystals", J. Phys. II France 5 (April 1995) in view of *Tsuboyama et al.*, U.S. Patent No. 4,775,225 as applied above, and further in view of *Yamazaki et al.*, U.S. Patent No. 4,973,138.

Tsuboyama does not disclose also dispersing beads in the liquid crystal. *Yamazaki* discloses having both pillars [5] and beads [4]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have both pillars and beads, motivated by *Yamazaki's* teaching that the pillars prevent the gap distance from expanding and the beads prevent the gap distance from contracting [abstract]; in other words, using both pillars and beads more carefully controls the gap spacing and thereby improves the display quality. Claim 25 is therefore unpatentable.

12. Claims 26-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Tsuda et al.*, U.S. Patent No. 5,280,375 in view of *Tsuboyama et al.*, U.S. Patent No. 4,775,225.

Tsuda discloses [see Fig. 1] a cell wall for a bistable nematic liquid crystal device having a first surface with a patterned surface profile [5, 7] to provide to different pretilt angles [4, 6] in the same azimuthal plane to molecules of liquid crystal material. *Tsuda* does not disclose at least one pillar.

Tsuboyama discloses having such pillars [307] in an analogous device. It would have been obvious to one of ordinary skill in the art at the time of the invention to have such pillars, motivated by *Tsuboyama's* teaching that such spacers maintain a cell gap

and provide good bistability free of orientation defects [col. 2, lines 34-38]. Claim 26 is therefore unpatentable.

The height of *Tsuboyama's* pillars is given as 1 μm [col. 13, line 35] and the width of such pillars was in the range 5-50 μm or greater than 50 μm [see Table 1], so claims 27-29 are also unpatentable.

The two configurations are optically distinguishable, so claim 31 is also unpatentable.

13. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Tsuda et al.*, U.S. Patent No. 5,280,375 in view of *Tsuboyama et al.*, U.S. Patent No. 4,775,225 and *Wenz et al.*, U.S. Patent No. 5,268,782.

Wenz discloses embossing such microstructures. It would have been obvious to one of ordinary skill in the art at the time of the invention to do so, motivated by the efficiency of mass production using embossing to produce such pillars. Claim 30 is therefore unpatentable. Also, note that this limitation is a product-by-process limitation, where the scope is limited only by the structure, not the steps performed, so claim 30 would be unpatentable even without the teaching of *Wenz* because the structure is not affected by the process limitation. Claim 30 is therefore unpatentable.

14. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Tsuda et al.*, U.S. Patent No. 5,280,375 as applied above.

Tsuda is silent on using positive and/or negative dielectric anisotropy material. The examiner takes official notice that positive and negative dielectric anisotropy are well known in LCDs [for instance, see *Li et al.*, U.S. Patent No. 5,831,700]; the two are

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considered to be art-recognized equivalents in this regard; so using either would have been obvious to one of ordinary skill in the art at the time of the invention, depending on the particular type of device which was preferred. Claims 34 and 35 are therefore unpatentable as well.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

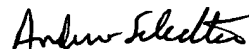
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Andrew Schechter
Primary Examiner
Technology Center 2800
22 December 2005